

University of Groningen

Community resilience

Montelongo Arana, Marina; Wittek, Rafael P. M.

Published in:
Building Research and Information

DOI:
[10.1080/09613218.2016.1212514](https://doi.org/10.1080/09613218.2016.1212514)

IMPORTANT NOTE: You are advised to consult the publisher's version (publisher's PDF) if you wish to cite from it. Please check the document version below.

Document Version
Publisher's PDF, also known as Version of record

Publication date:
2016

[Link to publication in University of Groningen/UMCG research database](#)

Citation for published version (APA):

Montelongo Arana, M., & Wittek, R. P. M. (2016). Community resilience: Sustained cooperation and space usage in collective housing. *Building Research and Information*, 44(7), 764-774.
<https://doi.org/10.1080/09613218.2016.1212514>

Copyright

Other than for strictly personal use, it is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), unless the work is under an open content license (like Creative Commons).

The publication may also be distributed here under the terms of Article 25fa of the Dutch Copyright Act, indicated by the "Taverne" license. More information can be found on the University of Groningen website: <https://www.rug.nl/library/open-access/self-archiving-pure/taverne-amendment>.

Take-down policy

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

Downloaded from the University of Groningen/UMCG research database (Pure): <http://www.rug.nl/research/portal>. For technical reasons the number of authors shown on this cover page is limited to 10 maximum.

RESEARCH PAPER

Community resilience: sustained cooperation and space usage in collective housing

Marina Montelongo Arana and Rafael P.M. Wittek

Department of Sociology, University of Groningen, Groningen NL-9712 TG, the Netherlands
E-mails: m.montelongo.arana@rug.nl and r.p.m.wittek@rug.nl

Collective action is a community resource crucial to ensure the resilience of communities. However, maintaining cooperation over time is also a significant challenge. Arguing that a major, though neglected, precondition for community resilience is sustained cooperation, this paper analyses the conditions triggering collective action in collective housing communities. Particular attention is paid to micro-level pathways through which characteristics of the common courtyard and the related rules for its use play for the maintenance or decay of collective action. The contours of an integrated theory of sustained cooperation is sketched. Drawing on Goal Framing (GF) theory and Common Pool Resource (CPR) theory, it is argued that CPR management institutions can only be effective in a community in which a normative goal frame is salient. Empirical material is presented from a multi-method comparative case study of four low-income urban collective housing communities in Mexico City in 2010. This evidence corroborates both approaches: the two communities characterized by sustained collective action exhibit a salient normative frame in combination with all elements of CPR managing institutions, whereas the two communities with failed collective action do not meet these conditions. The results suggest that both mechanisms are necessary for sustained cooperation to occur.

Keywords: agency, built environment, collective action, community, cooperation, courtyards, housing, resilience, self-governance, spatial configuration

Introduction

After a strong earthquake in Mexico City in 1985, two collective housing complexes, situated in two different neighbourhoods, collapsed. The neighbours, advised by a non-governmental organization, rebuilt the homes after a long cooperation process. Twenty years later, neighbours in the first community have neglected their premises, the common areas are dirty and abandoned. In contrast, the premises of the second community are well maintained, and its members organize a party to celebrate the collective purchase of solar cells that will power the light at night.

Resilience is a community's ability 'to sustain itself through change via adaptation and occasional transformation' (Magis, 2010, p. 401). In the case of collective housing, key indicators for community resilience

are a well-maintained physical infrastructure and some degree of social cohesion (for a general discussion of dimensions of resilience, see also Norris, Stevens, Pfefferbaum, Wyche, & Pfefferbaum, 2008). This raises an important question: Why do some communities develop long-term cooperative arrangements that achieve this, whereas others fail to do so?

So far, five general approaches to answer this question have emerged. The first, resilience as stability, conceives resilience as the ability of a community to 'absorb' disturbance and maintain function. The second, resilience as recovery, emphasizes the capacity of a community to 'bounce back' after external shock, usually a disaster (Maguire & Cartwright, 2008). Many studies in the tradition of these approaches emphasize the relative importance of physical and social factors for building resilience (Cutter et al., 2008; McEntire, 2012). The latter underline

community social networks and their ability to foster collective action as an important precondition for a community to recover from disaster (Adger, 2003; Aldrich & Meyer, 2015).

Third, transcending the emphasis on system stability inherent in recovery studies, the socio-ecological approach conceives communities as dynamic systems, in which the interactions between the social and the ecological factors will shape the development of the system. This approach considers disturbances in the system as an opportunity for reorganization and for eventually reaching a higher level of development (Folke, 2006; Maguire & Cartwright, 2008; Walker, Holling, Carpenter, & Kinzig, 2004), shifting the attention from resources to response options as key to resilience (Cote & Nightingale, 2012, p. 478).

Fourth, pointing to the limits of socio-ecological, economic and technological analysis, scholars advocating an institutional approach (Adger, 2000; Anderies, Janssen, & Ostrom, 2004) advocate the crucial role that formal and informal rules and their enforcement play in ensuring the ability of a socio-ecological system to adapt to change.

In an important recent assessment of the resilience literature, Cote and Nightingale (2012) acknowledge the need for infusing resilience research with institutional analysis (Adger et al., 2009), but also warn that attempts focusing mainly on how to ‘get the rules right’ (Ostrom, 1990) will not provide much leverage. Key to their alternative, situated approach to resilience is to ‘move away from attention to institutional configurations alone, and towards the processes and relations that support these structures’ (Cote & Nightingale, 2012, p. 480).

The present contribution follows this lead. More specifically, drawing on Lindenberg’s Goal Framing (GF) theory (Lindenberg, 2006, 2014; Lindenberg & Steg, 2013), it develops the argument that one of the most advocated institutional configurations for sustained cooperation – Ostrom’s (1990, 2000) design principles for the management of common pool resources (CPRs) – will not work unless a collective orientation, *i.e.*, a normative goal frame, is cognitively salient in a sufficiently large proportion of the community. This proposition is explored with data from a multi-method qualitative case study on four collective urban housing communities in Mexico City, carried out in 2010.

At the centre of this effort is the assumption that sustained cooperation is a major instrument to realize community resilience. Cooperation is defined as a joint production between two or more parties (Lindenberg & Foss, 2011), and it can be sustainable if the outcomes of the joint production remain valuable for

those involved. The present study focuses on cooperation in situations where individuals face a specific type of collective action problem: situations in which everybody would be better off cooperating, but where it is individually rational not to cooperate.

This study makes at least four distinct contributions to the literature on cooperation and community resilience. First, it adds to theories of cooperation by shifting the focus from the triggers of cooperation to the conditions for sustained cooperation. Second, based on in-depth qualitative research and elaborating in detail on the two theories studied, it shows that both a salient normative goal frame and compliance with the institutional design principles are necessary conditions to sustain cooperation in common pool situations. It therefore provides ethnographic evidence for a theory of sustained cooperation. Third, it develops an inductive typology of different types of cooperation in low-income neighbourhoods, thereby enriching cooperation research with ethnographic insights on a neglected though important class of small-scale cooperative behaviours. Finally, the study provides insight into the link between collective action and resilience in low income communities, highlighting the role of the central courtyard in promoting or blocking cooperation.

The paper is structured as follows. First, the two theoretical frameworks are briefly presented, highlighting their main assumptions about conditions for sustained cooperation, as well as how they are related. This is followed by a description of the research design and key characteristics of the four case study sites. Then the comparative case analysis is presented along with the conclusions.

Theoretical background

The availability of some common facilities, like a central courtyard, is a characteristic of many collective housing projects. This paper argues that, like any other CPRs, such common space may face the ‘tragedy of the commons’. As access to the common space is open to all members of the group, and it is individually rational to overuse it, the collective outcome may be (1) depletion of the common pool (Hardin, 1968) and (2) low levels of cooperation to maintain the resource efficiently. Consequently, the question ‘When will central courtyards be used in a sustainable way?’ becomes key to an improved understanding of the conditions that strengthen or deteriorate sustained cooperation in housing projects. It is argued below that this question can be answered by integrating CPR and GF theories.

CPR theory (Ostrom, 1990, 2000) probably is among the most widely used frameworks to explain sustained cooperation at the level of local communities. One of

its key assumptions is that sustained use of CPRs is possible if appropriate governance structures are put in place and enforced. But, as Cote and Nightingale (2012) have observed, one of the major weaknesses of this neo-institutional economic theory remains that it focuses on getting the rules right, rather than on the social and normative conditions that support these governance structures. The most explicit attempt to tackle this gap has been offered by GF theory (Lindenberg, 2006, 2014; Lindenberg & Steg, 2013). Its main argument is that a collective orientation translated into a salient normative goal frame is a precondition for institutions to function.

Common Pool Resource theory

CPRs are:

natural or humanly created systems that generate a finite flow of benefits where it is costly to exclude beneficiaries and one person's consumption subtracts from the amount of benefits available to others.

(Ostrom, 1990, p. 148)

When dealing with finite natural resources, CPR theory assumes that the users will have strong incentives to manage them in a sustainable way. But in order to do so, individuals need to solve two types of cooperation problems. First, order cooperation means that individuals limit their own use of the resource. Second, order cooperation means that individuals actively monitor and sanction norm compliance of other community members. The problem is that in both cases individuals have an incentive to free-ride on the efforts of others (Heckathorn, 1989). Nevertheless, cooperation can emerge because most populations do not only consist of rational egoists who defect in both first- and second-order cooperation situations, but also conditional cooperators who are willing to bear the costs of initiating cooperation and sanctioning, and continue to do so if others reciprocate. Consequently, it is crucial to facilitate easy recognition of conditional cooperators, as they will start cooperative actions based on reciprocity and trust. These initial actions subsequently can serve as the basis for the design and implementation of an institutional structure that reinforces sustainable first- and second-order cooperation (Ostrom, 2000). Ostrom (1990, 2000) specified seven of these design principles:¹

1. *Clearly defined boundaries*

Knowledge of who belongs to the group enables the emergence of trust and reciprocity between group members. Group activities that strengthen beliefs about the trustworthiness of other members can create symbolic boundaries.

2. *Equity rules*

Congruence between benefit allocation (amount, time, quantity and technology) and required inputs (labour, material, money) enhances the willingness to maintain agreements.

3. *Collective and adaptive rules*

In order for rules to be effective, efficient and (perceived as) fair, the rule-making process needs to be participatory in nature and responsive to changing context conditions and needs (Ostrom, 1990, 2000). Tinkering with rules is necessary to establish the combination of rules best suited to address particular situations, rather than striving for optimal, permanent or unique rules (Ostrom, 2008).

4. *Monitoring*

Monitoring CPR conditions and user behaviour encourages norms compliance. If a formal monitoring agency is absent, the second-order free rider problem needs to be solved informally.

5. *Gradual sanctions*

Graduated sanctions (*i.e.*, sanctions tailored to the severity of the norm violation and that take situational and contextual circumstances into consideration) prevent widespread noncompliance and promote trust-building among participants. Gradual sanctions are useful to make offenders know that trust is still there, but a violation has been noticed. This enhances trust among participants because they know violations will be noticed and punished, avoiding general breakdown of rules.

6. *Conflict management arena*

Since frequent conflicts have the tendency to undermine trust, a system in which conflicts are aired and treated quickly strengthens norm compliance.

7. *Institutional awareness*

This principle emphasizes the importance attributed to recognition by local authorities of the informal rules established by community members. Authority's recognition is necessary for successful rules implementation.

The opportunity for face-to-face communication reinforces the positive effect of these design principles, as communication facilitates the building of trust, reciprocity and reputations (Ostrom, 1998). Communication also allows participants to recognize who has cooperated before and is likely to do so again; it allows individuals to learn to cooperate (Axelrod, 1984) and to produce and evaluate cooperative signals (Deutsch, 1949), to express their preferences and needs (Rusbult & Van Lange, 2003), to make

commitments and promises, and to reinforce group identity.

Goal Framing theory

GF theory rests on three key assumptions. First, human behaviour is to a large degree driven by ‘goal frames’. A goal frame is a salient overarching goal that dominates an individual’s mindset in a given situation. GF theory distinguishes three overarching goal frames. In any given situation, only one of these goals is dominant, with the other two goals either reinforce or temper the salience of the main goal. Individuals in a hedonic goal frame will strive to realize immediate pleasure, whereas a salient gain goal frame will trigger them to realize long-term benefits. Finally, when a normative goal frame dominates an individual’s mind, their main concern is to ‘do what is right’. The salient goal structures an individual’s attention, *i.e.*, it influences what one likes at that moment, what information one finds relevant or what one expects others to do.

Second, the three overarching goal frames differ in *a priori* strength, with the hedonic goal frame being the strongest, followed by the gain goal frame and the normative goal frame. The latter is the weakest, but also the major precondition for sustained cooperation. Whereas the hedonic goal frame does not need much support to become the salient overarching goal, the normative goal frame needs continuous strengthening. Otherwise, it will be displaced by the hedonic or gain goal as the salient overarching goal frame.

Third, the main factor influencing which of the three overarching goal frames will be salient is a situational cue from the environment in an individual’s mind in a given situation. Consequently, GF theory seeks the identification of conditions that strengthen or weaken the normative goal frame. These conditions are highly context and situation dependent. For example, subjects in an experiment behaved much more selfishly if the experiment was labelled a ‘Wall Street Game’, and they were much more cooperative if the experiment was labelled a ‘Community Game’ (Liberman, Samuels, & Ross, 2004). Similarly, GF field experiments showed that the observation of others complying to a norm increases the relative salience of the normative goal frame in the observer (Keizer, Lindenberg, & Steg, 2008). Since the institutional context is an important source of situational cues, and an adherence to rigid rules may reduce an individual’s normative motivations (Frey & Jegen, 2001), maintaining a salient goal frame might also require tinkering with rules.

With regard to conditions affecting the salience of the normative goal frame in a group context, GF research identified two factors as particularly important

(Lindenberg, 2014): collective identity and feasibility beliefs. Collective identities are needed for group members to be able to engage in behaviours favouring the collective. Individuals must be able to identify with group interests and objectives, and have some sense of belonging to a group. Feasibility beliefs reflect the assessment that cooperative ventures can be successful and that everyone will benefit from them. Feasibility beliefs, in turn, are influenced by previous success experiences, by monitoring and gain for each (important for knowing that others will keep contributing), by legitimate leadership, and by collective identity.

Hence, from a GF perspective, explaining sustained cooperation in collective housing requires identifying the conditions that foster or undermine the production of a strong collective identity and positive feasibility beliefs. As the empirical analysis below will reveal, strong external pressures (*e.g.*, threats from the formal authorities and police), the need to take urgent action (*e.g.*, due to construction problems), as well as the characteristics of the courtyard (*e.g.*, size and form) play a major role here. More specifically, feasibility beliefs increase where courtyards foster friendly informal interaction, but they suffer where lack of space causes irritations and conflicts.

Integrated framework: a Goal Framing theory of Common Pool Resource management

Both theories are complementary in that they emphasize norms and the importance of ensuring compliance to the related formal and informal rules. CPR theory describes the institutional conditions that allow group members to identify conditional cooperators, and to monitor and sanction those who break the rules. GF theory points to a crucial precondition for this mechanism to function, but that is lacking in CPR theory: a shared and salient cognitive orientation to the collective. Without the activation of such a normative goal frame, the design principles will not work. Clearly defined boundaries (principle 1) will not work if there is no identification with the group inside these boundaries. For rules to have a regulating effect, individuals need to feel an obligation to follow them (principles 2 and 3). For group members to bear the costs of monitoring and sanctioning (principles 4, 5 and 7), they need to have a motivation to do so, and they need to accept the related informal rules in the first place. And for a common arena like a courtyard actually to facilitate conflict management, a normative goal frame is necessary for group members to be sensitive to (subtle cues of) norm violations in the first place. Consequently, an analysis of the link between sustainable cooperation and community resilience requires two steps. First, one needs to identify to what degree an obligation to contribute to the collective is salient in a community, and the conditions that keep such a

normative goal frame salient. Then one has to assess to what degree Ostrom's design principles are in place and enforced.

Based on this integrated theoretical framework, the following proposition can be derived: sustained cooperation within a given community becomes more likely to the degree that (1) an orientation focusing on the collective (*i.e.*, a normative goal frame) is shared and remains cognitively salient in a sizeable proportion of the collective, and (2) a set of rules (design principles) is present that enable specifying, monitoring, and sanctioning first- and second-order cooperative acts.

Research design and data

Answering the research question required data collection in low-income collective housing communities in Mexico City. These communities are located in the most dangerous parts of the metropolis, and their inhabitants are notoriously suspicious of outsiders. In order to minimize personal risks for the researcher, access to four communities was negotiated based on the first author's existing personal contacts (Paterson, Gregory, & Thorne, 1999). The main selection criterion for a research site to be included was that the housing community had shared facilities, like a courtyard.

A multi-method comparative approach was used. Observational, interview, video and survey data were collected in four different collective housing communities with a central courtyard and common facilities in Mexico City in 2010. Direct observation was performed at irregular intervals over a period of three months. It included participating in social activities such as attending meetings, joining lunch and entering into long, informal conversations. Semi-structured interviews (of duration between 30 minutes and two hours) were conducted with three different types of stakeholders: two experts in housing and urban development, one key informant in each compound, and 14 neighbours. The interviews focused on how social dynamics in collective housing were shaped by their social historical context, and on neighbours' perceptions of exposure to different cooperative situations. Finally, a total of 28 questionnaires were distributed among participants to capture diverse information, including socio-economic data. Conversation topics from video recorder sessions were classified into categories for further analysis. Secondary sources of information supported previously obtained interview and survey data.

In all four cases, all the houses were on the ground floor distributed around a central courtyard (Figure 1). Community 1 (Pedro Anaya 190) is located in Pedro



Figure 1 The courtyards: (a) Pedro Anaya 190; (b) Gorostiza 36; (c) Labradores 23; and (d) Trípoli 910. Sources: (a) Organización Popular Martín Carrera A.C.; and (b–d) authors

Anaya 190, in the Martin Carrera residential area, north of Mexico City. Community 2 (Trípoli 910) is located in Trípoli 910, in Sta. Cruz Atoyac residential area, in the central area of the city. Communities 3 and 4 are located in Gorostiza 36 and Labradores 23 respectively in Morelos residential area, near Mexico City's historic centre. All neighbours own their dwelling units, but they share ownership over common areas.

The communities differ with regard to the size (and shape) of the central courtyard, interior spaces, housing density, construction quality and common facilities (Table 1). The size and shape of the courtyards are important because they affect the degree to which the members of the community are interdependent in terms of the need to share space (*i.e.*, small and corridor-like courtyards imply more interdependence, while at the same time providing fewer opportunities for leisure activities than spacious, rectangular courtyards).

Analysis

As will be elaborated below, the case analyses show that two of the communities (C2 – Trípoli and C3 – Gorostiza) show clear evidence for sustained forms of collective action related to both the physical (collective maintenance activities) and the social ‘infrastructure’ (collective leisure activities). Collective leisure activities included the organization of celebrations, meetings and gatherings, and involve the use of the common space (*i.e.*, the courtyard). Collective maintenance activities range from painting and water tank maintenance to carrying out a variety of repairs. Unlike leisure activities, they are perceived as actions demanding high levels of sacrifice, because individuals have to make larger financial contributions, and invest more time when participating.

Hence, if the key proposition of this paper holds, the two communities with sustained collective action should show signs of a salient normative goal frame

in combination with the CPR design principles being in place and enforced. In contrast, the communities without sustained collective action should miss at least one of the two conditions. The remainder of this section first addresses the two communities with sustained collective action and then the communities where collective action failed (for a summary overview of the profiles of all four communities along with the theoretical constructs of this study, see Tables 2 and 3).

Communities with sustainable collective action: Trípoli 910 and Gorostiza 36

In both cases for these two communities, the central courtyard consists of a closed structure, therefore providing clear boundaries (principle 1). There was an explicit and consistent link between benefit allocation and responsibilities. For instance, each member was required to take on her share to keep the central courtyard free of rubbish, with the consequence that if someone has a plant, they must sweep their area more often than the others (principle 2).

Decisions were made in an open and participating process and rules were taken according to specific local people's situations and context (principle 3). For instance, in both communities, low-income households with large families were allowed to delay the pay of their maintenance dues. Tinkering with rules was a common practice to solve conflicts. An example of this was seen when the method for collecting money for common property maintenance works (cleaning of the water tank and plastic barrels) was changed in Trípoli 910. In this case, participants agreed on a weekly fee in order to pay a worker to do the task. The agreement did not succeed. They then changed to a monthly collection that also did not work, and concluded that the participants who were unable to pay the fee would contribute in kind: with handwork. Another example occurred also in Trípoli 910, where a

Table 1 Descriptions of the four communities

Communities (C)	C1 – Pedro Anaya 190	C2 – Trípoli 910	C3 – Gorostiza 36	C4 – Labradores 23
Size – central courtyard	Small (1.80 × 36 m)	Medium (3.60 × 25 m)	Big (4.50 × 18 m)	Medium (7.0 × 11 m) ^a
Density (inhabitants/DU) – maximum	2.5 (5)	2.5 (6)	4.2 (5)	4.0 (6)
Number of dwellings	24	07	21	15
Dwelling size (m ²)	12	40–52	60–140	48
Construction quality	Bad	Good	Good	Good
Common facilities	Toilet, laundry	Laundry	None	None
Socio-economic status	Very low	Low–medium high	Low–medium	Low–medium
Education	Illiterate – SS	PS – Uni	PS – Uni	PS – HS

Note: ^aDivided in two opposite sections of each 3.50 × 5.50 m. SS = secondary school; PS = primary school; Uni = university; HS = high school.

Table 2 Overview of the types of cooperation, their triggers and linkages with CPR and GF theories

	C1 – Pedro Anaya 190	C2 – Trípoli 910	C3 – Gorostiza 36	C4 – Labradores 23
<i>Exogenous triggers – incidental</i>				
Agency (formal authorities)	✓	✓	✓	✓
Defence (external community threats)	✓	X	✓	✓
Urgency (building condition)	✓	✓	✓	✓
<i>Endogenous triggers – sustainable</i>				
Maintenance – central courtyard	X	✓	✓	X (past yes)
Maintenance – Real estate	X	✓	✓	X (past yes)
Leisure	X	✓	✓	X (past yes)
<i>Common Pool Resource (CPR) principles</i>				
1. Clear boundaries	✓	✓	✓	✓
2. Equity rules	X	✓	✓	X (past yes)
3. Adaptive rules/participatory process	X	✓	✓	X (past yes)
4. Monitoring	✓	✓	✓	✓
5. Gradual sanctions	X	✓	✓	X
6. Conflict management arenas	X	✓	✓	✓
7. Institutional awareness	X	✓	X	X
<i>Goal Framing (GF) theory</i>				
Collective orientation	X	✓	✓	X (past yes)

Notes: ✓ = yes, X = no

very strict official regulation imposed by an external authority regarding use of common space, in combination with high levels of tolerance to other's actions, caused generalized deviations from the norm among participants, thus causing negative externalities to all of them. Dog faeces in the common courtyard first caused significant disagreement. The dog's owner apologized, but his promise to clean whenever this was required was only partially fulfilled. But since neighbours liked the dog, the give and take of everyday life was re-established.

In all four communities, all members can observe what occurs in the courtyard. Monitoring (principle 4) can even overrun privacy, up to the point that all other inhabitants will notice guests of one household. Strict monitoring facilitated the application of *gradual sanctions* (principle 5). For instance, in Gorostiza 36, non-compliance (e.g., not doing her share of painting the common property), triggered gossip among neighbours. Gossip can be interpreted as a first mild step, which creates mutual understanding about the infraction, without sanctioning the offender. Similarly, in Trípoli 910 neighbours talked with the dog's owner to persuade him to comply with community rules before taking tough actions against him. All these processes occurred in the central courtyard, pointing to its pivotal function as a conflict management arena (principle 6).

Institutional awareness (principle 7) is strong only in Trípoli 910. In Gorostiza 36, problems with local authorities arose from activities that were at odds with local regulations (e.g., informal trade). This complicates the relationship between community members and local authorities. In contrast, in Trípoli 910, institutional awareness translated into government support when necessary. For instance, the government accelerated its actions related to the legal process to transfer ownership from a private property regime to a condominium property regime.

As for conditions contributing to the salience of a normative goal frame, both communities can draw on periods of intense and successful previous cooperation. The latter was induced by some urgent need (e.g., fixing the damage to a building), and therefore undertaken with high external pressure. These forms of cooperation were directed towards achieving specific goals and required the participation of a large majority of community members. This in turn enabled individuals to identify with group interests and objectives, thus creating a sense of membership and a moral obligation to act in favour of the group.

For example, a non-governmental organization guided Gorostiza 36 through the remodelling process after their homes were partially destroyed by the large 1985 earthquake: a process that can be

Table 3 Sustainable cooperation: CPR (courtyard)-based activities

Communities (C)	C1 – Pedro Anaya 190	C2 – Trípoli 910	C3 – Gorostiza 36	C4 – Labradores 23
<i>Sustainable cooperation</i>				
Leisure		Celebrations Plants, pets, relax	Celebrations Plants, relax	
Maintenance – central courtyard		Cleaning	Cleaning	
Maintenance – actual state		Painting Water tank	Painting Fix leaky roof	
<i>Common Pool Resource (CPR) principles</i>				
1. Clear boundaries	Courtyard – actual state (closed structure)	Courtyard – actual state (closed structure)	Courtyard – actual state (closed structure)	Courtyard – actual state (closed structure)
2. Equity rules		To do her fair share: Cleaning Painting	To do her fair share: Cleaning Painting	
3. Adaptive rules/ participatory process		Tinkering exercises: Payments at a later day Switching from payments to labour Adapting official regulation to local circumstances	Tinkering exercises: Payments at a later day	
4. Monitoring	Permanent observation	Permanent observation	Permanent observation	Permanent observation
5. Gradual sanctions		Collaborative talks	Gossip	
6. Conflict management arenas		Resolution of conflicts To make rules and agreements	Resolution of conflicts To make rules and agreements	
7. Institutional awareness		Government support		

referred to as agency-induced cooperation. Similarly, this community also had engaged in joint legal action to stop relocation, or to prevent a thief or someone who sells banned products from being captured by police (defence-induced cooperation). Finally, both communities have experience with urgency-induced cooperation, arising from poor-quality construction of buildings. Actions related to this type of cooperation are: to demolish a roof before it crashes, to repair a collapsed drain or plumbing pipes, to repair leaky roofs and to restore power. Such positive previous experiences with cooperation also had a strong effect on feasibility beliefs. High levels of interdependency for the achievement of group goals influenced the belief that everybody in the community will gain from the different actions, further strengthening beliefs in the feasibility of the project. In addition, these collective actions created and reinforced trust, reciprocity and cohesion among participants, and it allowed anticipation each other's behaviour in future situations of common good production.

Given that the courtyard in both communities is relatively large, it offered multiple opportunities for friendly encounters, visibility and the staging of common events without triggering competition related to scarcity of space. For example, inhabitants organized celebrations, meetings and gatherings; they could keep their plants and pets there; and those with small apartments could use it as an area in which to rest and relax. It was perceived to be a safe space, so also children and older inhabitants came there. Consequently, it played an important role in keeping the normative goal salient in different ways. Whereas celebrations and gatherings reinforced group identity, daily friendly encounters reinforced interpersonal trust and reciprocity among members. Being a central and open place, the courtyard allowed the observation of other community members monitoring compliance to the group norms, thereby further reinforcing the normative goal frame.

To conclude, in both cases the co-occurrence of sustained collective action was observed, with both CPR

theory design principles and GF theory salience of a normative goal frame.

Communities with failed collective action: Anaya 190 and Labradores 23

Stable leisure- and maintenance-based cooperation had characterized Labradores 23, especially since 1985, when a non-governmental organization guided this community through the reconstruction process after their homes were totally destroyed by an earthquake. The case material shows, however, that this community only meets three of the seven design principles: the courtyard creates a clear boundary, allows monitoring and sometimes it is used as a conflict-management arena to solve interpersonal problems (principles 1, 4 and 6). What is lacking in the institutional arrangements are clearly defined rules about equity and participation (principles 2 and 3). Furthermore, there is no evidence of the application of gradual sanctions (principle 5), and institutional awareness is low (principle 7). Principles 1, 4 and 6 only apply because of the physical existence of the courtyard that, for example, allows the monitoring of actions. Principles 2, 3 and 5 do not apply since cooperation processes are rather absent.

Interestingly enough, this community can build on the three forms of incidental cooperation that enhance a collective orientation and feasibility beliefs, as they were identified for the two communities with sustained cooperation. Likewise, the courtyard was relatively spacious. But there was another development that had a strong negative impact on the salience of the normative goal frame: cooperation came under pressure with the arrival of a group of new neighbours who were involved in drug trafficking, and who also did not comply with many of the established norms. They had not experienced previous incidental cooperation in this community. Widespread violation of norms included the appropriation of common areas for private use, without respecting the turn-taking rules that were in place, or to listen to music at the highest volume. Rule breakers had not experienced previous incidental cooperation in this community. As a result, they also did not share the identity of the group, resulting in a lack of motivation to cooperate.

Neighbours (who had a strong collective identity and a well-grounded belief in the feasibility of the different projects rooted in successful past experiences) tried to make the informal sanctioning system work, but without success. Once the members of this community realized that their own attempts to sanction this behaviour would not be successful, they appealed to the local government, requiring active enforcement of the law, but without success. However, these legal actions against offenders led to personal threats against those

who promoted them. Hence, a high degree of institutional awareness of a self-governing system will only be effective if it can rely on responsive local authorities in those situations where their own capacities of control are exhausted.

As a consequence of the lack of action, the power balance in the community shifted in favour of this group of norm-violating newcomers, causing the gradual decline of the cooperative arrangements. In this case, the courtyard had the opposite effect than in the communities with sustained cooperation. Being constantly confronted with systematic violation of the rules undermined the feasibility beliefs in future collective projects, limiting the use of the courtyard to interpersonal encounters.

In terms of design principles and previous incidental cooperation, the second community with failed collective action, Anaya 190, reveals a similar pattern. Here, only two of the seven principles were realized: the courtyard has a clear boundary and is used for monitoring, but it is not used as a conflict-management arena. And like the other three communities, it can build on the three types of successful past cooperation. Particularly urgency-induced cooperation, arising from the poor construction quality of the buildings, triggered a long list of collective actions in this community. As in all other previous cases, these forms of cooperation were directed towards achieving specific goals, enabling individuals to identify with group interests and objectives, thus creating a collective identity. However, the normative goal frame could not be maintained.

What contributed to the erosion of a collective orientation in this community is the relatively small size of the courtyard. The resulting scarcity of common and private space resulted in internal conflict due to permanent interaction and lack of privacy (excessive monitoring). Solutions such as expansion of interior spaces to alleviate overcrowding or to improve services or infrastructure were not possible due to lack of financial resources. The possibility to alleviate this problem by applying for a governmental support programme was frustrated by the fact that several community members came into conflict with local regulations, resulting in local authorities not granting the necessary resources. Thus, collective actions in this community were limited to incidental actions carried out under high external pressure.

In sum, the two communities that failed to sustain collective action not only exhibit deficiencies with regard to the implementation of CPR design principles but also show clear signs of a severely weakened normative goal frame. Again, both cases are in line with the general proposition elaborated in the theory section of this contribution.

Discussion and conclusions

The patterns observed in each of the four cases are in line with the general theoretical proposition developed in this paper: sustained collective action related to the maintenance of a viable physical and social infrastructure is more likely in communities whose members share a salient normative goal frame and who implemented proper institutional arrangements to solve CPR dilemmas. These findings suggest that researchers and practitioners analysing the working of the design principles should pay closer and more systematic attention to the absence or presence of conditions that affect the salience of the normative goal frame. This study also allows for several other preliminary conclusions.

First, the study shows that the processes and structures in the four communities are congruent with the principles of the widely used CPR theory, but also with GF theory. In fact, the latter allowed identifying collective action-related processes that would have been neglected by CPR theory. This concurs with previous research (Witteck, 1999): ethnographic evidence suggests previous incident-related forms of cooperation delivered under conditions of high external pressure can foster collective identity. These forms of cooperation (described below) may be one of the preconditions for the normative goal-frame to be activated, and increase the probability of sustained collective leisure and maintenance activities.

Second, the presented case material revealed three types of incidental collective action geared towards the solution of problems originated from 'outside' players or the physical environment: agency, defence and urgency. By their very nature, the resulting cooperation is directed towards the solution of an imminent problem, and is not intended to endure over time. Here, a word of caution is required. Since the four communities all had experienced successful incidental cooperation in the past, practitioners and policy-makers may be tempted to assume that after having experienced the benefits of collective action and having developed beliefs in the feasibility of future projects, cooperative behaviour will 'automatically' transfer to sustained collective action related to maintenance and leisure activities. This is definitely not the case in two of the four communities under study.

Third, the case material shows two different triggers for the non-emergence and decay of sustained collective action. A small courtyard, in combination with poor financial conditions, prevented the emergence of durable joint maintenance and leisure activities in one of the communities. The arrival of a coalition of norm-violating and economically more powerful newcomers, in combination with insufficient formal rule enforcement, caused the decay of cooperation in the second community. Hence, a high degree of institutional awareness of a self-governing system will only be effective if it can

rely on responsive local authorities in those situations where their capacities of control are exhausted.

Fourth, the qualitative material in this study revealed that in low-income collective housing areas in mega-agglomerations like Mexico City, courtyards not only may constitute (and be analysed as) a common pool urban resource but also they can play an important role in keeping a normative goal frame salient and strengthening feasibility beliefs. For this to happen, members of the community need to share an orientation towards the group, and courtyards need to be large enough not to become a source of conflict over scarce space and related resources. That is, courtyards should meet the criteria defining CPRs, creating benefits for their users.

Fifth, this study shows the importance of collective action in building resilient urban low-income communities. Collective action enables community members to maintain a stable community in the absence of external shocks and implement actions for recovery after disturbances. Moreover, this study demonstrates that sustained collective action is a necessary condition for maintaining and improving the physical infrastructure, thereby increasing communities' capacity to absorb external impacts. Courtyards used and perceived as CPRs constituted crucial elements facilitating forms of sustained collective action related to the maintenance of physical and social infrastructure.

A limitation of this study needs to be mentioned. Being exploratory in nature, this study focused on a limited selection of communities, with a very specific ownership regime, socio-demographic background and spatial layout. Of course, this limits the generalizability of the empirical findings. Future studies might want to focus on larger samples and more standardized forms of measurement to explore further the conditions under which cooperation becomes sustained, including an effort to understand the relationship between the dimensions of the common space, its function, frequency of interaction, quality and types of cooperation.

To conclude, the present study also points to potentially fruitful areas for future investigation. It calls for the development of empirical research designs that disentangle the differential effects of the two key mechanisms for sustainable collective action, CPR design principles and GF, but also their interplay. Such research designs should implement more direct psychometric measures assessing collective orientations, goal frame salience and feasibility beliefs, as well as how community members actually perceive the institutional arrangements related to the management of courtyards. In relation to the physical layout of the facility, what constitutes an 'optimal' courtyard size with regard to facilitating the emergence of sustained

collective action for maintenance and leisure appears to be a fruitful area for future research.

Acknowledgements

The authors thank all community member participants, including professionals working at Casa y Ciudad A.C. (a member of Habitat International Coalition HIC – AL). The authors also thank the anonymous reviewers for their comments on an earlier version of this paper.

Disclosure statement

No potential conflict of interest was reported by the authors.

References

- Adger, W. N. (2000). Institutional adaptation to environmental risk under the transition in Vietnam. *Annals of the Association of American Geographers*, 90(4), 738–758. doi:10.1111/0004-5608.00220
- Adger, W. N. (2003). Social capital, collective action and adaptation to climate change. *Economic Geography*, 79, 387–404. doi:10.1111/j.1944-8287.2003.tb00220.x
- Adger, W. N., Dessai, S., Goulden, M., Hulme, M., Lorenzoni, I., Nelson, D. R., ... Wreford, A. (2009). Are there social limits to adaptation to climate change? *Climatic Change*, 93(3–4), 335–354. doi:10.1007/s10584-008-9520-z
- Aldrich, D. P., & Meyer, M. A. (2015). Social capital and community resilience. *American Behavioral Scientist*, 59, 254–269. doi:10.1177/0002764214550299
- Anderies, J. M., Janssen, M. A., & Ostrom, E. (2004). A framework to analyze the robustness of social-ecological systems from an institutional perspective. *Ecology and Society*, 9(1), 18. Retrieved from <http://www.ecologyandsociety.org/vol9/iss1/art18/>
- Axelrod, R. (1984). *The evolution of cooperation*. New York, NY: Basic Book.
- Cote, M., & Nightingale, A. J. (2012). Resilience thinking meets social theory situating social change in socio-ecological systems (SES) research. *Progress in Human Geography*, 36(4), 475–489. doi:10.1177/0309132511425708
- Cutter, S. L., Barnes, L., Berry, M., Burton, C., Evans, E., Tate, E., & Webb, J. (2008). A place-based model for understanding community resilience to natural disasters. *Global Environmental Change*, 18(4), 598–606. doi:10.1016/j.gloenvcha.2008.07.013
- Deutsch, M. (1949). An experimental study of the effects of cooperation and competition upon group process. *Human Relations*, 2(3), 199–231. doi:10.1177/001872674900200301
- Folke, C. (2006). Resilience: The emergence of a perspective for social-ecological systems analyses. *Global Environmental Change*, 16(3), 253–267. doi:10.1016/j.gloenvcha.2006.04.002
- Frey, B. S., & Jegen, R. (2001). Motivation crowding theory. *Journal of Economic Surveys*, 15(5), 589–611.
- Hardin, G. (1968). The tragedy of the commons. *Science*, 162(3859), 1243–1248. doi:10.1126/science.162.3859.1243
- Heckathorn, D. D. (1989). Collective action and the second-order free-rider problem. *Rationality and Society*, 1(1), 78–100. doi:10.1177/1043463189001001006
- Keizer, K., Lindenberg, S., & Steg, L. (2008). The spreading of disorder. *Science*, 322(5908), 1681–1685. doi:10.1126/science.1161405
- Liberman, V., Samuels, S. M., & Ross, L. (2004). The name of the game: Predictive power of reputations versus situational labels in determining prisoner's dilemma game moves. *Personality and Social Psychology Bulletin*, 30(9), 1175–1185. doi:10.1177/0146167204264004
- Lindenberg, S. (2006). Prosocial behavior, solidarity and goal-framing processes. In D. Fetchenhauer, A. Flache, B. Buunk, & S. Lindenberg (Eds.), *Solidarity and prosocial behavior: An integration of sociological and psychological perspectives*, 23–44. Amsterdam: Kluwer.
- Lindenberg, S. (2014). Sustainable cooperation needs tinkering with both rules and social motivation. *Journal of Bioeconomics*, 16(1), 71–81. doi:10.1007/s10818-013-9172-6
- Lindenberg, S., & Foss, N. J. (2011). Managing joint production motivation: The role of goal framing and governance mechanisms. *Academy of Management Review*, 36(3), 500–525.
- Lindenberg, S., & Steg, L. (2013). Goal-framing theory and norm-guided environmental behavior. In H. C. M. van Trijp (Ed.), *Encouraging sustainable behavior* (pp. 37–54). New York: Psychology Press.
- Magis, K. (2010). Community resilience: An indicator of social sustainability. *Society and Natural Resources*, 23(5), 401–416. doi:10.1080/08941920903305674
- Maguire, B., & Cartwright, S. (2008). Assessing a community's capacity to manage change: A resilience approach to social assessment: Bureau of Rural Sciences, Australian Government. Retrieved March 1, 2013, from http://adl.brs.gov.au/brsShop/data/dewha_resilience_sa_report_final_4.pdf.
- McEntire, D. (2012). Understanding and reducing vulnerability: From the approach of liabilities and capabilities. *Disaster Prevention and Management: An International Journal*, 21(2), 206–225. doi:10.1108/09653561211220007
- Norris, F. H., Stevens, S. P., Pfefferbaum, B., Wyche, K. F., & Pfefferbaum, R. L. (2008). Community resilience as a metaphor, theory, set of capacities, and strategy for disaster readiness. *American Journal of Community Psychology*, 41(1–2), 127–150. doi:10.1007/s10464-007-9156-6
- Ostrom, E. (1990). *Governing the commons: The evolution of institutions for collective action*. Cambridge, UK: University Press.
- Ostrom, E. (1998). A behavioral approach to the rational choice theory of collective action. *American Political Science Review*, 92(1), 1–22. doi:10.2307/2585925
- Ostrom, E. (2000). Collective Action and the Evolution of Social Norms. *Journal of Economic Perspectives*, 14(3), 137–158. doi:10.1257/jep.14.3.137
- Ostrom, E. (2008). Developing a method for analyzing institutional change. In S. S. Batie & N. Mercurio (Eds.), *Alternative institutional structures: Evolution and impact* (pp. 48–76). New York, NY: Routledge. Retrieved from <http://dx.doi.org/10.4324/9780203894439.ch3>
- Paterson, B. L., Gregory, D., & Thorne, S. (1999). A protocol for researcher safety. *Qualitative Health Research*, 9(2), 259–269. doi:10.1177/104973299129121820
- Rusbult, C. E., & Van Lange, P. A. (2003). Interdependence, interaction, and relationships. *Annual Review of Psychology*, 54(1), 351–375. doi:10.1146/annurev.psych.54.101601.145059
- Walker, B. H., Holling, C. S., Carpenter, S. R., Kinzig, A. P. (2004). Resilience, adaptability and transformability in social-ecological systems. *Ecology and Society*, 9(2), 5. [online] URL Retrieved from <http://www.ecologyandsociety.org/vol9/iss2/art5/>
- Wittek, R. P. M. (1999). *Interdependence and informal control in organizations*. Amsterdam: Thela Thesis.

Endnote

¹Ostrom mentions an eighth principle, which refers to multiple layers of governance in case of large systems. Since the focus of the present study is on small-scale local contexts, the authors do not address this principle.